NATIONAL PARK SERVICE

Conserve O Gram

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Planning a Microfilming Project for Preservation and Access

Archives and libraries use microfilm for the preservation and distribution of books, documents, ephemera, and photos. Microfilm lasts 100+ years if properly processed and stored. Microfilm may be digitized to enhance access. Both access and preservation are improved in hybrid systems that use microfilm for preservation and digital for access. Hybrid systems involve either microfilming first and producing digital files from the microfilm or digitizing first and producing Computer Output Microfilm (COM) from digital files. This *Conserve O Gram* (*COG*) describes how to microfilm materials.

To Plan a Microfilming Project Do…	Don't…
How to Plan Microfilming Projects: • Set your goals for the project. Produce: - a silver gelatin (halide) master (1st generation negative) - an intermediate printing master (2nd generation negative) - service copies (3rd generation positive) for use • If you can't afford all 3 copies, start with a master negative and find funds for the printing and service copies later. • Identify project staff, standards, film distribution plans, film format (roll film, microfiche) and project duration and dates. • Train your project manager and team in reproduction ratios, quality control, handling procedures, tonal range, etc. • Identify funding (park, association, program, or foundation). • Set up content selection criteria (See *COG* 19/10). • Quantify the sizes, formats, processes, and material types to be copied. See *When Materials Pose Special Problems* below. • Get a conservation assessment **before** reformatting. • Catalog and index your items first as they will last up to 20 times longer than unindexed materials due to less handling damage, according to the National Bureau of Standards. • Get an appraisal of collections for insurance by the contractor.	• Don't select microfilm primarily for its access capabilities. • Don't microfilm everything. Select items or collections. • Don't allow use of the master negative for access purposes. • Don't copy other filming contracts slavishly. Write your own. • Don't allow your contractor to subcontract filming/delivery. • Don't choose acetate-based films, use polyester. • Don't choose diazo films, as they fade even in the dark. • Don't choose vesicular films if they will be viewed in very hot equipment (>167°F). • Don't neglect to stabilize originals before scanning, including flattening, removing clips, removing mats and frames, and unfolding oversize items.

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How to Plan Microfilming Projects (continued): • Obtain contractor recommendations, sample contracts, and scopes of work (SOWs) from colleagues, NARA, or State Archives. • Contact filming organizations to identify potential contractors. • Obtain copies of standards/specifications. See *References*. • Write your contract and technical specifications, including: - filming, handling, quality control, shipping instructions - sample targets (bibliographic labels and use instructions) - complete micrographic standards and specifications • Send your draft contract to peers for review and comments. • Ask your contractor to insure the items for their fair market value and for the costs of conservation treatment (if damaged) • Consider both microfilm-to-digital and digital-to-COM as excellent strategies for both access and preservation.	• Don't ignore the pre-production issues, such as stabilizing the original; creating targets; arranging collections, double-checking all items, and packaging them for delivery. • Don't allow vendors to splice second generation film into your silver halide master negative.
When to Microfilm first, then Scan from the Film: Film first when: • capturing text, script, and line art is essential. • image density is consistent in text. • reformatting low use materials that must be preserved—as scanning can be done later from film when usage increases. • scanning would cause damage, such as unbinding rare books. • preservation is your top priority. Microfilm lasts 100+ years. You must refresh/migrate digital data every 5 years.	• Don't film first to capture photographs, tonal illustrations, segmented or oversize items, or items with inconsistent image density. Instead scan first, then produce COM. • Don't expect good quality scans from poor quality film.
How to Select & Prepare Materials for Filming: • Select materials to be microfilmed based on the park's Scope of Collections Statement and the criteria listed in *COG* 19/10. • Check for legal, ethical, or other restrictions. See *Museum Handbook*, Part III, Chapter 1, "Evaluating and Documenting Museum Collections Use" and Chapter 2, "Legal Issues." • Stabilize, collate, remove fasteners, flatten, arrange, and target the materials. Targets are instructions to users/filmers.	• Don't microfilm materials that don't relate to your Scope of Collections Statement and fit the reformatting criteria (high value, use, and/or risk). • Don't microfilm materials if you can purchase a good quality copy elsewhere.

To Plan a Microfilming Project Do…	Don't…
How to Select & Prepare Materials for Filming (continued): • Identify items already reformatted by other organizations by looking at the *National Registry of Microfilm Masters*. Buy copies of existing microfilm or digital copies. • Ensure that all materials to be microfilmed are cataloged accurately and completely. Archival materials should be described in a finding aid—use it to produce targets. • Ask your contractor to alert you if an item will not film well.	• Don't forget to place targets in the collection warning the photographer/filmer of missing, misnumbered or folded items.
What Materials Pose Special Problems for Reformatting? List and quantify the following in any microfilming contract: • Yellowed, brittle, torn, ripped, or fragile paper • Oversized, small, or oddly shaped materials • Friable media such as charcoal, graphite, pastels, or pencil • Handwritten or hand annotated materials • Materials with notations or images on their front and back • Illustrations, including line drawings, halftones, or blueprints • Blurred, faded, or bled-through images or text	• Don't use standard black-and-white microfilming for producing continuous tone images such as halftones, photographs, and some drawings and prints. Instead use continuous tone microfilm such as Fuji HRII and Minipositive microfilm.
What Microfilm Specifications to Follow in Your Contract: • State that all filming errors must be corrected within 30 days of identification at no extra charge to the park. • Follow American National Standards Institute (ANSI), Association of Imaging and Information Management (AIIM), and Research Library Group (RLG) Standards (See *References*). • For black-and-white microfilm emulsions, select silver gelatin film with an anti-halation dye layer such as Kodak AHU 1460 for master negatives, Kodak 2468 or 2470 for 2nd generation duplicating masters, and Kodak 2470 for illustrations. • For preservation of master negative color microfilms, select color separation processing which produces several exposures. • For access copies, select a stable color film like Kodak Ilfochrome.	• Don't use diazo or vesicular film. • Don't select cellulose ester (acetate) film. • Don't jacket, strip, or compose/reduce fiche; use COM or silver halide. • Don't film oversize materials out-of-sequence; instead change the reduction ratio (film smaller), or film the item in sections from left to right. • Don't allow splices in 2nd and 3rd generation film.

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What Microfilm Specifications to Follow in Your Contract (continued): • For roll film, select 16 or 35mm format, which look like motion picture film on a reel. **The larger the format, the less vulnerable the microfilm is to damage.** • For microfiche, select 105mm format microfiche (which looks like a plastic file card containing rows of images). • Select film with at least a 4 mil thick polyester (polyethylene terephthalate) film stock. • Select reduction ratios from 8:1-10:1 (8-10 times smaller); although an original may require 24:1 (24 times smaller). • Write your contract so that inspection and quality control data are recorded and provided to the park regularly. • Insist that contractors must sample and chemically test all master negatives daily using the methylene blue test. • Have the master negative and duplication master film toned with polysulfide, such as IPI SilverLock, for permanence.	• Don't accept film unless it is wound on chemically inert reels (not spools) with the first target at the outer end. • Don't allow skew (image tilt)>10%; instead insist framing and spaces between frames be consistent. • Don't forget to watch for irregularities from project to project.
How to Select Your Microfilm Contractor: • Ask for 3+ references. Check references thoroughly. • Prepare a test sample of materials containing all formats, problems, and sizes for all potential contractors to film. Compare the resulting work as described below. • Return unacceptable work to the contractors for refilming. Track how long it takes and any damage to original materials. • Visit the selected lab to view their facilities and meet staff. Is the space clean and secure? How do they handle materials? • Make your final decision based upon references, your personal experiences, and the price, speed, and quality of the work. • Select a special service filmer if the material is fragile or exceptionally valuable.	• Don't forget to develop a simple way to communicate problems and instructions. • Don't avoid regular meetings with your contractor. • Don't choose a standard commercial microfilming contractor for fragile items. • Don't accept unclean laboratories that lack expertise or basic equipment (book cradles, oversize planetary cameras, inspection tools).
How to Test Microfilm After Receipt from Vendor: • Check all returned master negatives completely (100%). Spot check (10+%) duplication masters & usage copies for: – correct targeting (internal bibliographic frame labeling) – correct housing and can labeling	• Don't accept or approve microfilm with incorrect focus, contrast, abrasions, fogging/fading, scratches, fungus,

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How to Test Microfilm After Receipt from Vendor (cont'd): – completion of quality control forms – correct order and completeness of originals and copies – legibility • The first quality control check of all items should be done by the contractor before sending the item to you. Insist on this. • Ensure that your contract include these quality control requirements too: – density measurements – brittleness test – curl test – methylene blue test for residual thiosulfate (ANSI IT9.1-1989 and PH4.8-1985) for new film. – quality index resolution test (ANSI/AIIM MS23-1991 with a standard of not <8.0 required).	blemishes, stickiness or blocking, powdery residues, curl, delamination, and splices. • Don't accept film with heat welds (only ultrasonic welds are allowed and no more than 6 are allowed per roll). • Don't accept density tests that don't make 12 readings a roll or 5 per title. Ask the test lab to average the results. **Note:** Maximum acceptable deviation from average should not be >0.15. Average density is 1.0-1.2 for most images.
How to Store Microfilm: • Store master film in a secure space that has HVAC with an air filtration/purification system that is at 65°F +/-5°, 35%RH +/-5% RH. Acclimatize for 3 hours before use. • Wear gloves when handling microfilm. • House extra copies of microfilm in other buildings. • House microfilm on chemically inert cores (no flanges) of uncoated polyester, polyethylene, and polypropylene. • House microfilm reels within neutral pH boxes, such as Conservation Resources MicroChambers, and microfiche in enclosure edge. Place the boxes and fiche in steel file cabinets which have neutral pH guides. • Check enclosures and housing (cores, boxes, and so forth) for acidity, chemical outgassing, stability, and defects. • Use neutral pH paper with neutral pH string and button closures to hold reels closed.	• Don't forget to conduct silver densitometric tests on stored film. • Don't use desiccant-based dehumidification systems or corrosion inhibitors in HVAC. • Don't draw water for humidification from impure sources. • Don't house film on coated plastic or metal cores, spools, or reels, particularly PVC. • Don't compress fiche or film or house them so loosely they fall over. Instead use dividers. • Don't use rubber bands or twine to hold reels closed.

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